Knowledge, Attitudes, and Practices of District Irrigation Engineers in Egypt Baseline Survey

Final Report

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with research technical assistance from
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Baseline Indicators

Indicator	Baseline value	Target value
Knowledge		
1 Able to explain rice policy easily	70%	90%
2 Knows sugar cane policy	61%	90%
3 Able to explain sugar cane policy easily	40%	90%
4 Able to explain policy on reusing drainage water easily	68%	90%
5 Know policy on farmer participation	60%	90%
6 Know three main ways in which future water needs will be provided	17%	80%
7 Know that Egypt might face water scarcity	66%	90%
8 Know that pollution affects water quantity	53%	90%
9 Know that Egypt has a fixed water supply	45%	90%
10 Know that ten countries share the Nile	35%	90%
11 Ever heard of a Water Users Association (WUA)	53%	90%
12 Able to cite three reasons why a farmer would want to join a WUA	18%	80%
13 Able to cite three key ways a farmer can save water	32%	90%
Attitudes		
1 Think farmer participation is a good idea	69%	85%
2 Able to cite three key advantages of farmer participation	20%	65%
Communication		
1 Heard of the Water Communication Unit (WCU)	75%	100%
2 Received last issue of WCU Newsletter	27%	100%
3 Read last issue of Newsletter	20%	80%
4 Feels that there is a relationship between him and Ministry	36%	64%
Practice		
1 Ever been trained to organise meetings	16%	90%
2 Ever been trained to make presentations	13%	90%
3 Currently doing two things to help farmers save water	12%	50%

Topics for District Engineers' Training

Knowledge

1 Teach engineers the basic set of facts concerning each basic Ministry policy and train them to communicate these policies clearly and well
2 Teach the economic, political, and strategic profile of the ten countries in the Nile Basin, focusing especially on those countries which contribute the greatest amount of water to the Nile Consider site visits to stations which measure the 55 5 billion m^3 quota in case of a regional workshop near Aswan, and a speaker from the relevant department in case this is not practical
3 Explain the logic of how water pollution affects water quantity, and how the amount of water available could be increased by reducing the level of water pollution
4 Inform engineers about Water Users Associations, their purposes, and functions, and benefits to water users, district engineers, and the Ministry
5 Focus on a specific set of key behaviors a farmer can do to save water
6 Present the Ministry's strategy on ways to provide for Egypt's future water needs (improved irrigation, reuse of drainage water, privatisation of water delivery, cost recovery, crop selection, etc)

Attitudes

7 Improve engineers' attitudes towards farmers
8 Boost engineers' image and prestige Encourage engineers to see themselves as a vital link between farmers and the Ministry

Communication

9 Focus on interpersonal communication skills and conflict resolution skills with farmers
10 To improve relationships with *bahara*, consider asking engineers to bring "model *bahara*" to the training workshop to share their experiences
11 Train engineers how to raise public awareness about issues relating to irrigation
12 Promote a specific set of behaviors which an engineer should be doing to improve two-way information flow

Practice

13 Teach problem solving skills specific to the needs of farmers in Egypt
14 Promote a specific set of behaviors which an engineer should be doing to help farmers save water
15 Train engineers in a set of ideal tasks they should be undertaking as district engineers
16 Train engineers how to organise meetings and how to make presentations

Topics for Senior Staff Training

Practice

1 Discuss with senior staff a set of ideal tasks they should expect from district engineers
2 Promote a specific set of behaviors which an engineer should be doing to help farmers save water

Introduction

Methodology

Sample design

Due to the relatively small number of district irrigation engineers, about 180 in the eighteen governorates excluding the border governorates, the research team decided to census the engineers rather than draw a sample Within the 18 governorates, two areas were excluded because they comprise new lands, rather than the old lands which are generating most of the irrigation problems The two areas excluded were seven *handasat* or engineering districts in Alexandria, and seven *handasat* of the Salhiya area in Sharqia governorate (a total of about 15 engineers) Other than these areas, the sample is nationally representative The geographic distribution of the sample is given in Table 1

Of the total 152 completed interviews, 91 were completed in Delta governorates, and 61 in Upper Egyptian governorates

Table 1 Distribution of the sample by governorate

Governorate	n	%
Dumiat	5	3%
Daqahlia	18	13%
Ismailia	6	4%
Sharqia	9	6%
Alexandria	5	3%
Beheira	14	9%
Kafr ElSheikh	11	7%
Gharbia	8	5%
Menoufia	7	5%
Qalyoubia	8	5%
Giza	9	6%
Fayoum	7	5%
Beni Suef	8	5%
Minya	11	7%
Assiut	9	6%
Sohag	8	5%
Qena	4	3%
Aswan	5	3%
Total	152	100%

Because most of the interviews were completed on field trips outside Cairo, it was not possible to return to interview engineers who were not available on the scheduled date The overall response rate, as shown in Table 2, was 84% The response rate by governorate varied between about 70% and 100%, except for Qena governorate, where the response rate was only 40% due to recent floods and the large distances between district offices and the governorate office where interviews were held

Table 2 Response rate

Completed interviews	152	84%
Not available	29	16%
Attempted interviews	181	100%

Questionnaire Design

The questionnaire was designed based on two main inputs

- qualitative in-depth interviews carried out by the Water Communication Unit staff with district engineers in July 1997, and
- a Multi-Part Team meeting with thirty guests from several agencies and representing different levels of seniority, including district engineers (a summary of the opening remarks to this meeting is included as Appendix A) A total of twenty-two ideal behaviors were drafted by five working groups (Appendix B), and these behaviors were incorporated as much as possible in questionnaire design

The questionnaire is comprised of 134 questions covering background characteristics, exposure to communication messages, knowledge of the water situation in Egypt, relations with *bahara* and with farmers,[1] relations with the Ministry, work skills, and general attitudes All topics are directly related to improving district engineers' partnership with water users The questionnaire took around 45 minutes to administer The questionnaire is included as Appendix D

Interviewer training

The team of interviewers completed a total of eight hours of questionnaire review and role play in the office Because the eight interviewers were very familiar with the subject matter, and had been trained in qualitative research in Phase II of the project, they did not need extra time to explain the content of the questionnaire The questionnaire was modified on the basis of sixteen role play interviews

Pretesting the questionnaire

Following modifications to the questionnaire, the eight interviewers split into two teams and pretested the questionnaire in two governorates, Gharbia and Qalyoubia, completing a total of twelve pretest questionnaires The team would have preferred to pretest more questionnaires,in part to provide response codes for open-ended questionnaires, but the small size of the universe of district engineers (180 engineers) precluded a larger pretest The pretest revealed possible fieldwork problems regarding the availability of specific engineers at the time requested, so knowing this in advance helped the team to better prepare for fieldwork

Fieldwork, coding, and data entry

Fieldwork was conducted by eight interviewers, staff of the Water Communication Unit, between October 4 and November 17, 1997

The team of interviewers developed codes for the twenty-one open-ended questions in the questionnaire, recorded responses categorised as "other," and recoded "other" responses in the case where these responses accounted for a large proportion of all responses to that question

The data were entered using EpiInfo version 6, a program which was designed to prevent errors on entry by duplicating ranges and skips printed on the questionnaire

[1] An organisation chart showing the structure of the Ministry at the governorate level is included as Appendix C

Data analysis and report format

The data were analysed on SPSS version 6 The Water Communication Unit team discussed the findings and interpreted SPSS output to determine the key findings included in this report

This report is designed to address two needs

- Baseline indicators for the field partnership component
- Topics to be covered in the engineers' training modules

Research findings related to each of these two points are italicised in the text of this report The indicators, their baseline values and target values for the impact study are summarised on the page vii of this report Topics to be addressed through the engineers' training program are listed on page viii of this report

Results

Background characteristics of respondents

Table 3 provides background characteristics of the district engineers All the engineers are men Virtually all engineers have a Bachelor of Science degree Respondents in Upper Egypt were significantly[2] younger than respondents in the Delta, 33 compared to 36 Reflecting this age difference, engineers in the Delta have significantly more years of experience on average than those in Upper Egypt, 8 years compared to 5 years

Most engineers (70%) are not originally from the districts in which they are working, and the table suggests that engineers do move from one district to another over time (comparing seven years of experience to four years in the current district)

There is a striking difference in the workload of engineers in the Delta compared to those in Upper Egypt Although the average size of a *handasa* in the Delta is 50,000 feddans compared to 35,500 in Upper Egypt, the average number of *bahara* or assistants is not significantly different between regions

Table 3 Background characteristics of respondents

Level of education	
Bachelor of Science	96%
Other	4%
Average age	
Delta	36
Upper Egypt	33
Total	35
Originally from current district	
Yes	30%
No	70%
Average years of experience	
Delta	8 years
Upper Egypt	5 years
Total	7 years
Average years working in this district	
Delta	4 years
Upper Egypt	4 years
Total	4 years
Average number of feddans per handasa	
Delta	50,000
Upper Egypt	35,500
Total	44,200
Average number of bahara per handasa	
Delta	27
Upper Egypt	29
Total	28

Knowledge

Knowledge of Ministry policies

We asked the engineers about the Ministry's four main policies, which concern rice cultivation, sugar cane cultivation, re-use of agricultural drainage water, and farmer participation in decision

[2] In this report all significant differences ' are significant at least at the p<0 05 level

making The coverage of these four policies has been varied, according to their importance the policy on rice growing probably receives the most press coverage nationally and from the Ministry, whereas the policy on farmer participation has received no attention in the national press and the least amount of publicity from the Ministry itself This pattern is reflected in the results shown in Table 4 Table 4 shows differences by region It is important that engineers in both regions be able to represent Ministry policies equally well

Table 4 Distribution of engineers by knowledge of basic Ministry policies

	Delta	U Egypt	Total
Policy on rice cultivation			
Know policy	98%	95%	97%
Don't know policy	2%	5%	3%
Able to explain easily	85%	48%	70%
Not able to explain easily	15%	52%	30%
Policy on sugar cane cultivation			
Know policy	59%	62%	61%
Don't know policy	41%	38%	39%
Able to explain easily	43%	36%	40%
Not able to explain easily	57%	64%	60%
Policy on reuse of drainage water			
Know policy	96%	90%	93%
Don't know policy	4%	10%	7%
Able to explain easily	75%	59%	68%
Not able to explain easily	25%	41%	32%
Policy on farmer participation			
Know policy	63%	56%	60%
Don't know policy	37%	44%	40%
Total	100%	100%	100%
Engineers	91	61	152

Overall knowledge of the Ministry's policy on rice cultivation is universal at 97% of all engineers, and it is high by region as well However, since little rice is grown in Upper Egypt, engineers are not as well informed about the policy, and when asked if they can explain the policy easily, were doubtful on some details, or were unable to explain the policy, only 48% of engineers said they

were able to explain the policy easily Overall, only 70% of engineers know enough of the details of this policy to be able to explain it well

Sugar cane policy is less well known overall, with only 61% of all engineers saying they know what the policy is, and little difference by region Fewer than half of engineers (40%) say they can explain the policy easily, and the percentage is especially low in Upper Egypt at just over a third of engineers (36%)

Knowledge of the Ministry's policy on reuse of drainage water is high, at 93% overall However, the details of the policy are not as well known, as shown in the much lower proportion of engineers who say they are able to explain the policy easily (68%), and especially low proportion in Upper Egypt (59%)

Finally, only 60% of engineers are aware of the Ministry's policy on farmer participation in decision making, with the lowest proportion in Upper Egypt (56%)

- *Training topic Teach engineers the basic set of facts concerning each policy and train them to communicate these policies to farmers and other agencies clearly and well*

- *Baseline indicators Ability to explain each of the four policies easily*

Knowledge of the water situation in Egypt

Just under half of engineers (45%) are aware that Egypt has a fixed water supply - that is the 55 5 billion m^3 set by treaty with Sudan in 1959 and measured daily near the Aswan Dam It is important that engineers are aware of this fact, since it would help them to understand the limited nature of the resource they are charged with distributing and the importance of efficient distribution

Only two-thirds (66%) of engineers are aware that Egypt might face a water scarcity Among engineers who said that Egypt will probably not face a water scarcity, 39% said that Egypt will avoid this problem by water conservation and new irrigation methods, 24% said that God would provide the water, and 12% said that Egypt would use water from the High Dam

Among those who thought that we might face a water scarcity, 22% thought a scarcity might result from inefficient agricultural use of water, 19% cited the increasing population and increasing demand from agriculture, followed by 11% identifying misdesigned policies and 10% citing the demands from new projects

- *Training topic Explain how increasing demands for water are pushing down the amount of water available per capita, and that we have already gone below the international standard of 1000 m^3 of water per person*

- *Baseline indicator 66% know that Egypt might face a water scarcity*

Only a third of engineers (35%) were able to correctly cite the number of countries drawing water from the Nile - ten countries However, an additional 27% cited nine countries, which was the correct number until Eritrea became independent

When asked if they thought that Egypt would be able to negotiate an increased quota, 73% of engineers said yes

- *Training topic Economic and political and strategic profile of the ten countries in the Nile Basin focusing especially on those countries which contribute the greatest amount of water to the Nile Consider site visits to stations which measure the 55 5 billion m^3 in case of a regional workshop near Aswan, and a speaker from the relevant department in case this is not practical*

- *Baseline indicator 45% know that Egypt has a fixed water supply*
- *Baseline indicator 35% know that ten countries share the Nile*

Most engineers (90%) feel confident they know how the water needs for new projects will be covered But there was less specific knowledge of the exact sources of water for new projects, as shown in Table 5

There was a fairly high recognition of the role of reusing drainage water, but relatively low awareness of the importance of other sources of water The Water Communication Unit will focus on engineers' knowledge of five main sources of water for new projects and future water needs

- water conservation in agriculture,
- irrigation improvements,
- reuse of drainage water,
- reduction in rice and sugar cane acreage, and
- cost recovery/privatisation

The proportion of engineers able to cite three of these five correct sources of water for the new projects was relatively low, at 17%, although just over half (51%) were able to cite two of these five sources, and 32% cited one correct source

Table 5 Distribution of engineers by source of water for new projects cited (selected reasons)

Source	Percent of engineers
Reuse drainage water	65%
Groundwater	34%
Irrigation improvements	29%
Water conservation	26%
Annual quota	19%
Reduce rice, sugar cane	14%
The Nile	13%

Does not total 100% because multiple responses were accepted

- *Baseline indicator 17% able to cite three main sources of water for new projects*

About half (53%) of the district engineers are aware that water pollution affects water quantity as well as water quality

- *Training topic The logic of how water pollution affects water quantity and how the amount of water available could be increased by reducing the level of water pollution*

- *Baseline indicator 53% know that water pollution affects water quantity*

Knowledge of Water User Associations

About half of the district engineers (47%) have never heard of one of the most important Ministry efforts in water conservation - the establishment of Water Users Associations (WUAs) Since only 974 WUAs have been established to date in seven governorates, it is not surprising that only 14% of all engineers have ever worked with a WUA

When we asked all engineers if they could think of a reason why a farmer would want to join such an association, 83% said they could

However, engineers were not very good at specifying those reasons, as shown in Table 6 Even the summary reason, "It's to his advantage," was only cited by one in five engineers

- *Training topic Inform engineers about Water Users Associations, their purposes, and functions and benefits to water users from joining them*

- *Baseline indicator 18% able to cite three benefits to a farmer of joining a Water Users Association*

Table 6 Distribution of engineers by suggested reason why a farmer might want to join a water users association (main reasons)

Reason	Percent of engineers
To provide water	24%
To help solve problems	23%
It's to his advantage	20%
To help save water	18%
To irrigate regularly	15%

Does not total 100% because multiple responses were accepted

Knowledge of water conservation techniques

Virtually every engineer told us he knew how a farmer could save water But as the findings in Table 7 show, the leading way of saving water was cited by only half of respondents (47%), suggesting little consensus among engineers about exactly how farmers could save water On average, each engineer was able to cite two ways to save water, and only a third (32%) were able to cite three ways to save water

- *Training topic Focus on a specific set of key behaviors a farmer can adopt to save water*
- *Baseline indicator 32% able to cite three ways a farmer can save water*

Table 7 Percentage of engineers who cited specific ways a farmer could save water (main reasons)

Method	Percent of engineers
Don't overwater	47%
Crop selection	26%
Clean mesqas	26%
Use new irrigation methods	22%
Follow irrigation schedule	18%
Levelling	14%
Night watering	13%

Does not total 100% because multiple responses were accepted

Attitudes

Attitudes towards farmers

When asked what word popped into their heads when we mentioned the word "farmer," the largest proportion (40%) of engineers mentioned their economic importance to the nation An additional 28% of engineers made sympathetic comments, followed by 16% making complaints about farmers, and 9% commenting that farmers need awareness training

When considering the most important problem faced by farmers today, 36% cited the availability of water

As a reflection of the quality of their relationships with farmers, 51% of engineers said that most farmers were cooperative, followed by 32% describing some farmers as cooperative A sizable proportion, 15%, felt that only a few farmers were cooperative

When asked whether they thought farmer participation in decision making was a good idea or not, 69% of engineers said they thought it was a good idea, 26% thought it was a bad idea, and 5% said they were unsure about it

Among those who thought it was a good idea, the main two reasons, cited by a third of engineers (33%) were not related to the farmer's interests, but to the engineers' or national interests - that is, sharing in the responsibility, and water conservation A smaller proportion of engineers cited

cooperation with neighbors in problem solving (22%), and realistic solutions to problems (14%) as advantages Just over one in ten engineers (11%) felt that WUAs would help farmers understand the engineers' work better

Over all the engineers, 18% were able to think of one advantage, 30% thought of two advantages, and 20% suggested three advantages

Among those who thought farmer participation in decision making was a bad idea, the main reason for thinking so was that the farmer is self-centered (60%) and that the farmer lacks the technical information (51%) Others thought it would be unwieldy - "The ship with too many captains sinks" (27%)

We also asked engineers what they felt they themselves could do to improve their relationships with farmers, and these are tabulated in Table 8 It is interesting to see that many of the things they cited have already been suggested through earlier qualitative work by the Water Communication Unit as "ideal behaviors" for engineers, and from the Multi-Part Team meeting, which drafted a set of twenty-two ideal behaviors (Appendix B)

Engineers say that the most important thing they could do to improve their relations with farmers would be to solve farmers' problems Hence this should be an important focus of training Good personal communication skills, as suggested by responses categorised as "Greet him nicely," and sincerity should also be emphasised

- *Training topic Problem solving skills specific to the needs of farmers in Egypt*
- *Training topic Personal communication and conflict resolution skills*

Table 8 Percentage of engineers who cited specific ways they could improve their relationships with farmers (main ways)

Method	Percent of engineers
Solve his problems	47%
Greet him nicely	32%
Keep my promises	24%
Stick to irrigation schedule	19%
Establish a friendship	14%
Meet with him regularly	12%
Make regular field visits	12%

Does not total 100% because multiple responses were accepted

We also asked the engineer how the farmer could improve his relationship with the engineer, and as an interesting reflection of the quality of their relationship, the suggestions in Table 9 have something of a negative cast to them

Table 9 Percentage of engineers who cited specific ways farmers could improve their relationships with engineers (main ways)

Method	Percent of engineers
Stick to irrigation schedule	24%
Stop canal violations	23%
Complain to engineer not boss	20%
Follow engineer's orders	18%
Don't break bridges	18%
Don't complain continuously	13%
Respect irrigation law	13%
Don't pollute water	11%

Does not total 100% because multiple responses were accepted

Attitudes towards their *bahara*

Responses to the word association question about the *bahara* were categorised as appreciative (39%), sympathetic (13%), complaint (20%), needs training (6%), or neutral (18%) So overall most comments about the *bahara* were positive (52%), while 26% of engineers felt there was room for improvement in the *bahara* There was a difference by regions, in that a higher proportion of engineers in Upper Egypt (18%) were sympathetic to the *bahara* than in the Delta (10%) This might reflect a reduced workload in Upper Egypt, as shown in Table 3

When asked whether they think that the *bahara* are "honest brokers" between the engineer and farmers, there seems to be some hesitancy in describing them this way 37% felt that most are "honest brokers," 42% say some are "honest brokers," 19% say few are "honest brokers," and 2% say none are "honest brokers "

- *Training topic To improve relationships with bahara, consider asking engineers to bring 'model bahara' to the training workshop to share their experiences*

The main reason preventing them from acting as "honest brokers," cited by 71% of engineers who said that only a few or no *bahara* were "honest brokers," was their low salary, followed by an additional 38% saying that *bahara* are exposed to corruption

Attitudes towards their direct supervisor

Considering that the interviews were conducted in the governorate office, it is not surprising that in the word association question ("What pops into your head when I say 'your boss' ") most engineers (69%) made positive comments about their direct supervisors, and only 9% had something negative to say, while 19% made neutral comments There was no regional difference

We asked whether engineers had ever been in a conflict with a large landowner, and a surprisingly large percentage, 45%, said they had been in such a conflict When all engineers were asked whether they felt that their supervisor would stand by them in such a conflict, 78% said they felt their supervisor would definitely stand by them, 12% said the supervisor would probably stand by them, 6% said the supervisor probably wouldn't stand by them, and 4% said they didn't know So by this measure, there seems to be a good relationship between engineers and their direct supervisors

In addition, when asked whether they feel that their direct supervisors listen to them, fully 88% said they felt their supervisor always listens to them As for those who feel that their supervisor only sometimes listens to them, as one respondent put it, "He's human "

Attitudes towards the Directorate and Ministry

In a word association question, where responses were categorised as positive, neutral, or negative, the bulk of engineers (72%) gave positive responses, while only 8% had negative views There was no difference by region

When asked whether they felt that the Directorate or Ministry staff listen to them, most engineers were favorable about the Directorate, with three-quarters saying that the Directorate always listens to them (Table 10)

However, when asked the same question about the Ministry, fully two-thirds of engineers said that they felt there simply was no interaction between them and the Ministry

- *Baseline indicator 64% say they have no relationship with the Ministry*

In order to get an indication of the feasibility of cost-sharing, we posed a delicate question to the engineers "When you think about the water situation in Egypt, and the solutions that the Ministry can try, do you think that the Ministry could charge for water for agriculture or not?" Surprisingly, almost half of the engineers (47%) thought that this could happen

We also asked engineers directly about the support they feel they need from the Ministry These results are shown in Table 11

The need for salary increases was highlighted by just over half of the engineers (54%), followed by a request for training by a quarter of the engineers Additional leading needs as reported by the engineers include the need for equipment and transportation

Table 10 Distribution of engineers by how well they feel the Directorate or Ministry listens to them

	Percent of engineers
Directorate	
Always listens to me	73%
Sometimes listens to me	20%
Doesn't listen to me	2%
No relationship with Directorate	5%
Ministry	
Always listens to me	23%
Sometimes listens to me	6%
Don't listen to me	7%
No relationship with Ministry	64%
Total	100%
Engineers	152

Table 11 Percentage of engineers citing specific ways the Ministry could help them in their work (main ways)

	Percent of engineers
Improve salary, social status	54%
Training sessions	24%
Provide equipment	24%
Provide services to district	13%
Provide transportation	11%
Engineers	152

Communication

Communication with Water Communication Unit

The Water Communication Unit has been in existence since July 1995, and as of November 1997, almost all district engineers (75%) had heard of the unit Still, 25% have not heard of the unit, with no significant difference by region

- *Baseline indicator 75% have heard of WCU*

The newsletter, which has been distributed since October 1995, has not achieved a high degree of coverage of the district engineers Only 27% of engineers reported that they had received the last issue of the newsletter, and there was a significant difference between regions 38% of engineers in the Delta had received the newsletter compared to only 15% of engineers in Upper Egypt One contribution of the research to this problem is that we requested a mailing address of each engineer, and are setting up a mail merge database to use with mailing labels to facilitate mailing the newsletter directly to district offices, instead of relying on the governorate office to distribute it to the district offices

- *Baseline indicator 27% had received the last issue of the newsletter*

Due to the low proportion of engineers who had received the last newsletter, an even lower proportion reported that they had read the last issue, as follows 20% overall, with a big regional difference - 27% in the Delta and 8% in Upper Egypt We certainly need to improve coverage of district engineers in Upper Egypt

- *Baseline indicator 20% had read the last issue of the newsletter*

We asked engineers what they would like to read about in the newsletter, in order to ensure that the articles cover the topics that interest them most Half of respondents (57%) said they would like to read about the Ministry's policies and about new irrigation projects In a related question, 86% of engineers said that they are asked about the new projects, and 81% of engineers said they need additional information about these projects

A further 26% said they would like to receive technical information through the newsletter The other main category of interest was articles detailing the role of the district engineer and his problems This might be an interesting opportunity to have a regular feature on "ideal engineers" and their experiences

The baseline survey was the first time the Water Communication Unit has attempted to get a broad picture of what problems the district engineers face in their work They cited a total of twenty-one different problems, and those cited by more than ten engineers are listed in Table 12 While it is beyond the capacity of the Water Communication Unit to resolve the problem of low salaries and availability of water, it is within our capacity to convey these problems to those responsible within the Ministry

- *Training topic Train engineers how to raise public awareness about issues relating to irrigation*

Table 12 Percentage of engineers who say they face certain problems in their work (main problems)

	Percent of engineers
Low salaries	38%
Availability of water	18%
Lack of technical capacity	16%
Lack of staff	14%
Transportation problems	14%
Lack of police cooperation	11%
Lack of public awareness	9%
Administrative burden	7%
Lack of time	7%
Engineers	152

Percentages do not total 100% because more than one response was allowed

We also asked the engineers directly how the Water Communication Unit could best support them in their work It is good to see from Table 13 that the engineers are anxious to receive additional publications and reports related to their work, since this work is within the current capacity of the Unit The same is true of the remaining three leading ways that the engineers said the Unit could support them

Table 13 Percentage of engineers who cited specific ways the Water Communication Unit can support them in their work (main ways)

	Percent of engineers
Distribute publication and reports	57%
Raise farmer awareness through the media	41%
Convey engineers' problems to Ministry	22%
Meet engineers to hear/monitor problems	15%
Engineers	152

Percentages do not total 100% because more than one response was allowed

Communication with the public

In order for engineers to carry out the public communication tasks which the project plans to strengthen, they need skills in organising meetings and making presentations Table 14 shows their current skill levels in these areas

While the majority of engineers feel confident that they are good at organising meetings and making presentations, most have never been trained in these skills Engineers could probably benefit from professional training

- *Training topic How to organise meetings and how to make presentations*

Table 14 Percentage distribution of engineers by skill level in public communication

	Percent of engineers
Organising meetings	
Good at organising meetings	80%
Unsure of skills	17%
Not good at it	3%
Ever trained in organising meetings	16%
Never trained in organising meetings	84%
Making presentations	
Good at making presentations	80%
Unsure of skills	19%
Not good at it	1%
Ever trained in making presentations	13%
Never trained in making presentations	87%
Engineers	152

District engineers do attend local council meetings - on average nine meetings in the six months prior to the survey Almost one in six (14%) engineers reported attending two a month, and a similar percentage attended one a month

District engineers also attend town council meetings, an average of eight in the six months prior to the survey Almost a quarter of engineers (23%) reported attending two meetings a month, and an additional 19% reported attending one meeting a month

Only half of the engineers had attended a meeting of the agricultural cooperative in the six months prior to the survey Virtually all engineers (97%) said that they could benefit from cooperation with the director of the agricultural directorate, and the same proportion had ever met the director in their district In fact, district engineers had met with the agricultural director an average of sixteen times in the six months prior to the survey

Practice

Job description

Although there is a formal job description for the work of a district engineer, we were interested to hear the engineers tell us about the different tasks they do These are listed in Table 15

There is wide agreement among engineers that their main task is to deliver water to farmers, followed by their quasi-police role in reporting and acting on violations About two-thirds mentioned that they clean the main canals and solve farmers' problems

- *Training topic Train engineers in a set of ideal tasks they should be undertaking as district engineers*

Table 15 Percentage of engineers who say their job includes certain tasks (main tasks)

	Percent of engineers
Distribute water	83%
Report violations	70%
Clean main canals	64%
Solve farmers' problems	61%
Make field visits	56%
Administrative work	56%
Measure levels of canals/mesqas	53%
Attend local council meetings	48%
Maintenance	40%
Attend Ministry meetings	11%
Engineers	152

Percentages do not total 100% because more than one response was allowed

Fieldwork practices

Due to the quite different sizes of *handasat* between regions, the same number of *bahara* , and finally the fact that most rice is grown in the Delta and not in Upper Egypt, there is quite a difference between regions in the number of problems engineers face with farmers This is reflected in the findings presented in Table 16

Table 16 District engineers' workload and fieldwork practices

	Delta	U Egypt	Total
Average number of farmers who come in per day			
during peak water use	25	7	18
during minimum use	1	1	1
Average number of times you go out to check on canals per week			
during peak water use	7	5	6
during minimum use	3	3	3
Engineers	91	61	152

The number of farmers coming into a Delta engineer's office per day during peak water use is significantly higher than in Upper Egypt twenty-five farmers compared to seven Interestingly, during times of minimum water use, the average is identical Reflecting the greater need to get out to check on problems, the Delta

engineer goes out seven times a week to check on his canals during peak water use, compared to five times in Upper Egypt The average number of field visits in times of minimum water use is identical in both regions

Almost all engineers (84%) said they were working even now to help farmers save water But when asked what they were doing to help farmers save water, only two actions - cleaning canals and holding awareness meetings - corresponded with the Water Communication Unit's view of what engineers *could* be doing to help farmers save water, as shown in Table 17

Table 17 Percentage of engineers who cited specific ways they are currently "helping farmers to save water" (main ways)

Method	Percent of engineers
Clean canals	39%
Open canals on schedule	32%
Extra water to ends of mesqas	18%
Hold awareness meetings	17%
Make field visits	15%
Get water to farmer	11%

Does not total 100% because multiple responses were accepted

- *Training topic Promote a specific set of behaviors which an engineer should be doing to help farmers save water*

- *Baseline indicator 12% of engineers currently doing two correct things to help farmers save water*

Conclusion

We feel that the survey has certainly accomplished its two main goals of identifying topics for the training of district engineers and baseline project indicators The indicators we have identified here give the project a clear idea of what to aim for

Although the main findings are listed on the first two pages of the report, we can summarise here by saying that we found relatively low levels on some knowledge questions, considering that the average respondent had seven years of experience This is an area in which the project hopes to show excellent impact through training and materials development and distribution

Attitutdes were found to be relatively difficult to measure by questionnaire, and we may consider using qualitative methods such as observation to try and measure this in future efforts There seems to be quite a tendency to avoid negative responses, even to fairly indirect questions about attitudes The fact that our fieldwork schedule required us to conduct interviews in the governorate office may be a source of bias in measuring attitudes towards the supervisor and the Ministry

Our measures of communication were successful, and pointed at gaps which are highly amenable to improvement under the project, such as increasing the coverage of the newsletter among district engineers, and improving the level of readership by raising the quality of writing Skills in communication with the public will certainly be addressed in the training curriculum

Finally, measures of behavior are important as long-term indicators for the project it is always more difficult to change behavior than it is to change knowledge and attitutdes, and hence we have identified fewer behavior indicators for this phase of the project than knowledge, attitude, and communication indicators

Appendix A

Summary of comments made by Dr Yehya Abdel Aziz,

Head of Irrigation Division

at Multi-Part Team meeting on district engineers' ideal behaviors

Sunday, Sept 21, 1997

There has been in the past a lack of truthfulness and trust between power and the people Some time ago, the word *sulta* (power) was taken to mean pressure and submissiveness This created a kind of psychological complex between the average citizen and the government, some of which remains even today

At the time of the floods, farmers had to use their cattle to assist in building dikes, and the district engineer could requisition earth from his land to build dikes Even after the floods, the district engineer still has power - the judicial power to impose fines And this has made the farmer fear the engineer to some degree, there is none of the affection or feeling of togetherness that characterises a good relationship But today the people are more empowered

Now, how can we build trust between the authorities and users? Not without building a feeling of togetherness and cooperation

- We must live the life of the farmer We should know him, know about his life, how he works and how he thinks If any of you is from a rural area, you'll know how to estimate the worth of a man in a *galabia* We're the kind of people who see men in suits, riding in cars as respectable, but poor men in *galabias*, with a white skullcap on his head and slippers as his feet as just any old body That isn't right There is wisdom and knowledge in the rural areas You could sit with a farmer, someone in a tarboosh, and he could say things that even the great author Taha Hussein wouldn't say

- The engineer must see the farmer or beneficiary as a very respectable man, like his father, his brother, or his uncle Respect is very important in working with the farmer When we work with the farmer with respect, he is valued, his opinion is valued, we listen to what he says, and sometimes we have to ask what he thinks This is a way to build the spirit of trust

- We should use everyday language The farmer shouldn't feel that the engineer is using overly superior language with him or that the engineer is better than he He should feel that the engineer is coming to help him Use polite words to address farmers like "father," "uncle," or "pilgrim " The district engineer needs to know the language of the *mastaba* (the village) I used to solve all the problems on the *mastaba* (ie in the village, on site) Every village has its keys, and it helps to know what they are

- But when an engineer comes and sits with farmers, it really looks bad when they bring him a chair and the farmers sit on the ground It looks like he's high and they're low It looks like he has power and they don't But when he sits with them, you ll find that there's a beginning of trust of affection and friendship This opens people to begin talking with you and listening to you

- The government employee is a public servant, since it's the people who pay taxes It's the people who make money and pay taxes, and that's where our salary comes from The engineer serves the farmers by getting water to them on time, and undertaking projects to help farmers increase their production
- Participation is very important Not everything we say to farmers should be do's and don'ts Instead, we should ask him to come and talk with us, ask what the problem is, and how we should solve it Even if we don't do what we talk about, he feels that you respect him That is very important

- Dr Abdel Hady Radi had a really good idea in establishing the Water Communication Unit, because relationships with farmers have changed and methods of communication have changed Communication is very important in building trust At the beginning of IIP, people were opposed But the project was successful in many places, and it spread to other places Now you'll find that farmers are saving money, increasing productivity, and using less water

Having good relationships with our users will help solve a lot of problems

Appendix B

Principles of ideal behaviors for district engineers

Results of the Multi-Part Team meeting, September 21, 1997
at the Library of the Ministry of Public Works and Water Resources

Developing a sense of friendship between the engineer and the farmer

1 Treat the farmer with patience and forbearance to solve problems between them without resorting to the force of law
2 Behave humbly with farmers when working to resolve their problems
3 Respect the farmer's opinion and don't mock his ideas even if they seem simple or naive
4 Speak to the farmer in a sincere way so he doesn't lose his trust in the engineer
5 Speak to the farmer in simple language

Principles of good listening

6 Greet the farmer nicely
7 Don't interrupt the farmer while he's speaking
8 Focus your attention on the speaker
9 Ensure that you understand the details of the problem that the farmer is explaining

Technical skills

10 Read a lot so that you'll be able to answer all sorts of questions
11 Give a complete explanation to the farmer when answering a question
12 Go out into the field
13 Read the newsletters of the Water Communication Unit
14 Be available in the office or in the field so that the farmer can find you when problems arise
15 Maintain the waterways so that water reaches the ends of the canals
16 Organise workshops for farmers with the Water Communication Unit

His role as a means of communication between water users and other agencies

17 Have convincing leadership qualities
18 Establish strong ties to leaders in society through regular meetings
19 Cooperate with the agricultural engineer
20 Break the boundaries between the government and technicians by attending to the social side

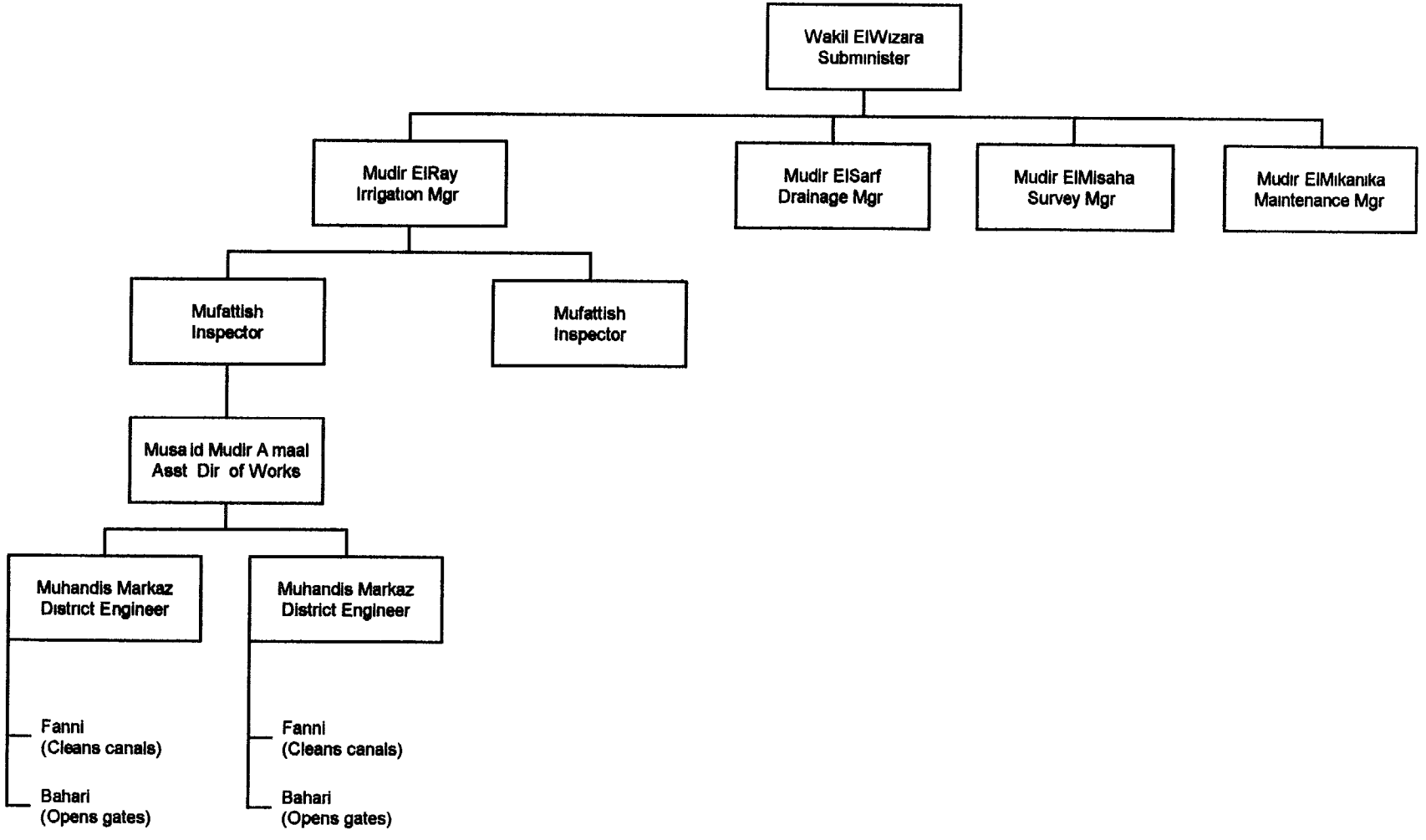
His role as an honest broker for all farmers

21 Through your behavior, make it clear that you are above suspicion
22 Distribute water fairly to all users regardless of personal considerations

Appendix C

Organisation Chart of the Ministry of Public Works and Water Resources at the Governorate Level

Irrigation Management Levels in the Governorate, MPWWR



Appendix D

Baseline Questionnaire for District Engineers

(English version)

Ministry of Public Works and Water Resources
Water Communication Unit
Corniche Imbaba
Warraq ElArab, Giza

Knowledge, Attitudes and Practices of District Engineers

Baseline Questionnaire

1	Questionnaire number		
2	Governorate		☐☐
3	Handasa		☐☐
	Engineer name		
4	Interviewer		☐☐
5	Date of interview	/ / 97	
6	Questionnaire edited by		☐☐
7	Data entered by		☐☐
8	Result of interview	Completed 1 Refusal 2 Not available 3 Error in sample listing 4	

Good morning/good afternoon My name is _____ I work in the Water Communication Unit at the Ministry of Public Works and Water Resources May I have about half an hour of your time? I'd like to ask you some questions about your work here in the district

The Ministry wants to improve its relations with water users, especially farmers Since engineers deal with farmers most, the Ministry will begin looking for ways to improve relations with farmers through farmers The Ministry has assigned this task to the Water Communication Unit.

My questions today relate to your work in general, and your work with farmers

Although I do know your name, your name will never appear in any report, and all your views will be completely confidential, as our report will summarise the views of xxx field engineers, and will not focus on the views of any one individual

So that we can get in touch with you in the future, may I have the address of your office in the district?

Name of office _____

Number _____ Street _____

District _____ Post code _____

Governorate _____

Background information			
9	Could you tell me your age?	Age in completed years ☐☐	
10	What is your highest level of education?	B S 1 M S 2 Other_____ 3	
11	For how many years have you worked as an irrigation engineer?	Experience in completed years ☐☐	
12	Are you originally from this district?	Yes 1 No 0	
13	How long have you worked in this *handasa*?	Years in district in completed years ☐☐	
14	How many feddans are in this *handasa*?	Number of feddans ☐☐,000	
15	How many baharis do you have working in this *handasa* now?	Number of baharis ☐☐	
Word Association			
	Now I'll say a word Please you tell me the first thought that pops into your head For example, if I say "China", what is the first thing you think of? _____		
16		The American woman _____ The Ministry _____ ☐☐	
17		Music _____ Your direct supervisor_____ ☐☐	
18		University _____ The bahari _____ ☐☐	
19		Cairo _____ A farmer_____ ☐☐	
Exposure to communication messages			
20	I'd like to ask you about some of the Ministry's policies Do you know what the Ministry's policy is on growing rice?	Yes 1 No 0	→22
21	When someone asks you about the Ministry's policy on growing rice, • can you explain it <u>easily</u>, • or are you <u>unsure</u> about some of the details, • or can you <u>not explain it at all</u>? <u>Probe</u> If respondent has never had to explain, how well could he explain the policy	Explain it easily 1 Doubtful on some details 2 Can't explain it at all 3	
22	Do you know what the Ministry's policy is on growing sugar cane?	Yes 1 No 0	→24

23	When someone asks you about the Ministry's policy on growing sugar cane, • can you explain it easily, • or are you unsure about some of the details, • or can you not explain it at all? Probe If respondent has never had to explain, how well could he explain the policy	Explain it easily Doubtful on some details Can t explain it at all	1 2 3	
24	Do you know the Ministry's policy on re use of drainage water?	Yes No	1 0	 →26
25	When someone asks you about the Ministry's policy on re using drainage water, • can you explain it easily, • or are you unsure about some of the details, • or can you not explain it at all? Probe If respondent has never had to explain, how well could he explain the policy	Explain it easily Doubtful on some details Can't explain it at all	1 2 3	
26	Do you know the Ministry's policy on farmer participation in decision making concerning water?	Yes No	1 0	 →31
27	Do you think that farmer participation in decision making is a good idea or a bad idea?	Good idea Unsure Bad idea	1 2 3	 →34 →31
28 29 30	What are the advantages of farmer participation in decision making concerning water?	1 ____ □ 2 ____ □ 3 ____ □		→34 →34 →34
31 32 33	What are the disadvantages of farmer participation in decision making concerning water?	1 ____ □ 2 ____ □ 3 ____ □		
34	Before today, had you heard of the Water Communication Unit?	Yes No	1 0	
35	Did you receive this newsletter? (hold up copy)	Yes No	1 0	 →38
36	Did you read it?	Yes No	1 0	 →38

37	Which article did you find most useful?	Nothing 0 Who is Dr Abu Zeid 1 Dr AZ and Dr W visit WResCtr 2 Dr AZ's speech 3 Ministerial decisions 4 WResCtr in Dr AZ's era 5 Workshop for MPWWR and Ag 6 Social news 7 Everything 8	
38 39 40	What would you like to read more about in the newsletter?	1 _____ ☐ 2 _____ ☐ 3 _____ ☐	
Knowledge of the water situation in Egypt			
41	Do people ask you about the new projects?	Yes .. .. 1 No 0	
42	• Do you have <u>enough</u> information about the Tushka/New Valley and Salaam Canal projects, • or do you have information but <u>need more</u>, • or do you <u>not have any</u> information about them?	Have enough information 1 Missing some information 2 No information 3	
43	Do you know how the water needs of the new projects will be provided for?	Yes 1 No 0	→47
44 45 46	How will they be provided for? How else?	1 _____ ☐ 2 _____ ☐ 3 _____ ☐	
47	When you think about the water situation in Egypt, do you believe that Egypt could face a problem of water scarcity?	Yes 1 No 0 Don't know 7	→49 →50
48	What is the most important reason why you say that Egypt probably will not face a problem of water scarcity?	Plenty of water 1 God will look after us 2 Other _____ 3 Don't know 7	→50 →50 →50 →50
49	What is the most important reason why you say that Egypt might face a problem of water scarcity?	Population growth 1 Increasing demand by agriculture 2 Increasing demand by industry 3 Possibility of drought .. 4 Other _____ 5 Don't know 7	
50	Now I'd like to think with you about water pollution Of course water pollution affects the quality of water But does water pollution affect the quantity of water available?	Yes 1 No 0 Don't know 7	

51	Is the amount of water available to Egypt fixed, or is there some way that Egypt could obtain more water?	Fixed 1 Could obtain more 2 Don't know 7	
52	How many countries share the waters of the Nile? (including Egypt)	Number of countries ☐☐ Don't know 77	
53	Can Egypt negotiate with the other countries to increase her quota?	Yes 1 No 0 Don't know 7	
54	When someone asks you a question and you don't know the answer, do you • usually know where to go for information, • or sometimes yes and sometimes no, • or usually don't know?	Usually know 1 Sometimes yes, sometimes no 2 Usually don't know 3	
55	Where do you usually get the information you need?	1 _____ ☐	
56		2 _____ ☐	
57		3 _____ ☐	
Relations with *bahara* and farmers			
58	Now I'd like to ask you a little about the *bahara* who work with you What is the nature of their work?	Yes No	
59		Reporting water levels 1 0 Reporting violations 1 0	
60		Helping in shift work 1 0	
61		Carry out engineer's orders 1 0	
62		Reporting blocks in canals 1 0	
63		Resp for opening/closing water 1 0	
64		Other _____ 1 0	
65	In your opinion, do • most of the *bahara* play the role of honest broker between the engineer and the farmer, • or do some of them play that role, • or does a small proportion play that role, • or are there none at allne at all?	Most of them are honest brokers 1 Some are honest brokers 2 A few are honest brokers 3 None are 4	→68a →68a
66	Why don't they play that role?	1 _____ ☐	
67		2 _____ ☐	
68		3 _____ ☐	

68a	Now I'd like to ask you about farmers' problems From your experience with them, what problems do farmers face in general? 1 _____ 2 _____ 3 _____ 4 _____ 5 _____			
69	Among those problems, which one do you think is the farmer's most important problem?	Availability of water Costs Sickness Poverty Lack of education Lacks information Doesn't accept new ideas Thinks badly of the Ministry Salinity in the soil Law about land ownership Land fragmentation Ignorance Lack of awareness Doesn't have problems Other_____ Don't know	01 02 03 04 05 06 07 08 09 10 11 12 13 14 15 77	
70	• Are <u>most</u> of the farmers in your district cooperative with you, • or are <u>some</u> of them cooperative, • or only a <u>small proportion</u> cooperative, • or are they <u>not cooperative</u>?	Most coooperative Some cooperative Small proportion cooperative None cooperative	1 2 3 4	
71	Are you satisfied with your relationships with the farmers?	Yes No Don't know	1 0 7	→74 →74
72 73	Why not?	1 _____ ☐ 2 _____ ☐		
74	Have you ever heard about water users associations?	Yes No	1 0	 →76
75	Have you ever done anything with a water users association?	Yes No	1 0	
76	When I say "water users association," can you think of a reason why a farmer might want to one?	Yes No Don't know	1 0 7	 →80 →80
77 78 79	What reasons? Any other reason?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐		
80	About how many farmers come <u>to see</u> you per day in times of peak water use?	Number of farmers ☐☐		

81	And in times of least water use?	Number of farmers ☐☐	
82	About how many times do you go out to the *tira'* per week in times of peak water use?	Number of times ☐☐	
83	And in times of least water use?	Number of times ☐☐	
84	Do you have any idea how a farmer can save water?	Yes 1 No 0	→88
85 86 87	What could he do? Anything else?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	
88	In terms of saving water in agriculture, do you do anything now to help farmers conserve water?	Yes 1 No 0	→92
89 90 91	What do you do?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	
92 93 94	What could you do to improve your relations with farmers?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	
95 96 97	What the farmer do to improve his relations with you?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	
98	Have you ever been in a conflict with a large landowner?	Yes 1 No 0	
Relations with the Ministry			
99	If you were in conflict with a large landowner, do you feel that the people over you at work • would <u>certainly</u> stand by you, • would <u>probably</u> stand by you, • or would <u>probably not</u> stand by you?	Certainly stand by me 1 Probably stand by me 2 Probably wouldn't stand by me 3	
100	In terms of the directorate office in the governorate, do you feel that they • <u>always</u> listen to you, • <u>sometimes</u> listen to you, • or that they <u>don't</u> listen to you?	Always listen to me 1 Sometimes listen 2 Don't listen 3	

101	In terms of your direct supervisor, do you feel that he • always listens to you, • sometimes listens to you, • or that he doesn't listen to you?	Always listens to me 1 Sometimes listens 2 Doesn't listen 3	
102	And in terms of the Ministry in Cairo, do you feel that they • always listen to you, • sometimes listen to you, • or that they don't listen to you?	Always listen to me 1 Sometimes listen 2 Don't listen 3 No contact with Ministry 4	
Work skills			
103	What are the main things you do in your work?	Y N Distribute water 1 0	
104		Paperwork /reports 1 0	
105		Violations 1 0	
106		Clean main canal 1 0	
107		Local council meetings 1 0	
108		Canal levels 1 0	
109		Solve farmers' problems 1 0	
110		Ministry meetings 1 0	
111		Going out to see *tira'* 1 0	
112		Other _____ 1 0	
	Now I'd like to ask you about the problems you face in your work. What problems do you face? 1 _____ 2 _____ 3 _____ 4 _____ 5 _____		
113	Among those problems, which are your three main problems?	1 _____ ☐☐	
114		2 _____ ☐☐	
115		3 _____ ☐☐	
116	• Do you know how to organise meetings well, • or are you usure about your skills in organising meetings, • or do you feel that you don't know how to organise meetings well? Probe If he hasn't organised a meeting: "If you had to organise a meeting "	Know how to do it well 1 Unsure of skill level 2 Not good at it 3	
117	Have you had any training in how to organise meetings?	Yes 1 No 0	

118	• Do you know how to present information at meetings well, • or are you <u>unsure</u> about your skills in presenting information, • or do you feel that you <u>don't know</u> how to present information well?	Know how to do it well 1 Unsure of skill level 2 Not good at it 3	
119	Have you had any training in how to make presentations?	Yes 1 No 0	
120	How many meetings of the local council have you attended in the last six months?	Number of meetings ☐☐	
121	How many meetings of the town council have you attended in the last six months?	Number of meetings ☐☐	
122	How many meetings of the agricultural cooperative have you attended in the last six months?	Number of meetings ☐☐	
123	Do you think that cooperation with the agricultural extension could benefit you?	Yes 1 No 0	→125
124	Why not?	_____ ☐	
125	Have you ever met the agricultural extension supervisor for your district?	Yes 1 No 0	→127
126	How many times have you met him in the last six months?	Number of times ☐☐	→128
127	Why haven't you met him?	_____ ☐	
Attitudes			
128	The government is generally responsible for providing a sufficient and clean water supply But is there anything that you can do to help?	Yes 1 No 0	
129	When you think about the water situation in Egypt, and the solutions the Ministry can try, do you think the Ministry might charge farmers for agricultural water or not?	Yes 1 No 0 Don't know 7	
130 131 132	How can the Ministry support you in your work?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	
133 134 135	Last question As the Water Communication Unit, how can we support you in your work?	1 _____ ☐☐ 2 _____ ☐☐ 3 _____ ☐☐	

Interviewer's comments

1 _____

2 _____

3 _____

4 _____

5 _____

6 _____